

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of the Claims:

1-25. (Canceled)

26. (Currently Amended) A method of recovering a metal rich fraction from a metal-ceramic based composite, the method including the steps of increasing the size of at least ~~the a~~ ceramic component within the metal-ceramic based composite by heating the metal-ceramic based composite, crushing the metal-ceramic based composite to reduce the size of the metal rich fraction in the composite in comparison to the ceramic ~~fraction component~~ in the composite, and then separating ~~the reduced sized metal rich fraction from~~ ~~of~~ the increased sized ceramic component ~~from the other components of the crushed composite~~ to result in a metal rich fraction ~~in~~ ~~powder form having a volume fraction of metal that is greater than about 60%, wherein separation of the components is achieved by sedimentation, electrophoresis, electrostatic methods, magnetic separation, chemical leaching, or the like.~~

27. (Original) The method according to claim 26 wherein the metal based composite is heated to a temperature of between about 1500°C and about 1650°C.

28. (Original) The method according to claim 26 wherein the metal based composite is held at a temperature of between 1500°C and 1650°C for a time of between about 0.5 hours and about 10 hours.

29. (Canceled)

30. (Canceled)

31. (Original) The method according to claim 26 wherein the metal is titanium, yttrium or copper.

32.-34. (Canceled)

35. (Previously Presented) The method according to claim 26 wherein the metal-ceramic based composite includes metallic phases, intermetallic phases, oxides, nitrides, carbides or silicates.

36. (Previously Presented) The method according to claim 35 wherein the metallic phases, intermetallic phases and oxides include Ti(Al₁O), Ti₃Al(O) and TiAl(O) and Al₂O₃.

37. (Previously Presented) The method according to claim 26 wherein the ceramic component that increases in size is Al₂O₃.

38.-46. (Canceled)

47. (Previously Presented) The method according to claim 37 wherein the mean particle size of the Al₂O₃ is increased by the heat treatment which brings about coarsening of the Al₂O₃ particles.

48. (Canceled)

49. (Currently Amended) The method according to claim 48 26 wherein the metal-based ceramic composite is crushed and milled following heat treatment to form ~~a the~~ powder and ~~to decrease the size of a component in comparison to other components.~~

50. (Previously Presented) The method according to claim 49 wherein the crushing or crushing and milling occurs in an inert environment such as under argon or a vacuum.

51. (Currently Amended) The method according to claim 49 wherein the crushing time or crushing and milling time is limited to minimize reduction of the size of the increased size of ~~the~~ ceramic component.

52. (Currently Amended) The method according to claim 48 26 wherein the powder is mixed with surfactant and water to produce a suspension for separation.

53.-54. (Canceled)

55. (Currently Amended) The method according to claim 54 26 wherein the volume fraction is greater than about 90%.

56. (Currently Amended) The method according to claim 54 26 wherein the metal rich fraction collected following separation is reacted with a reducing agent.

57. (Currently Amended) The method according to claim 54 26 wherein the oxygen content of the metal rich fraction is less than about 1.5 atomic %.

58. (New) The method according to claim 52 wherein the surfactant comprises sodium dodecyl sulphate.

59. (New) A method of recovering a metal rich fraction from a metal-ceramic based composite, the method including the steps of increasing the size of particles of at least a ceramic component within the metal-ceramic based composite by heating the metal-ceramic based composite, crushing the metal-ceramic based composite to reduce the size of the metal rich fraction in the composite in comparison to the ceramic component in the composite, separating the reduced sized metal rich fraction from the increased sized ceramic component to result in a metal rich fraction in powder form having a volume fraction of metal that is greater than about 60%, reacting the metal rich fraction with a reducing agent, and leaching the metal rich fraction with an acid to remove products of the reduction reaction.

60. (New) The method according to claim 59 wherein after crushing the metal-ceramic based composite to reduce the size of the metal rich fraction in the composite in comparison to the ceramic component of the composite, a suspension of the crushed composite is prepared, and wherein the suspension comprises a surfactant.

61. (New) The method according to claim 59 wherein the metal based composite is heated to a temperature of between about 1500°C and about 1650°C.

62. (New) The method according to claim 59 wherein the metal based composite is held at a temperature of between 1500°C and 1650°C for a time of between about 0.5 hours and about 10 hours.

63. (New) The method according to claim 59 wherein the metal is titanium, yttrium or copper.

64. (New) The method according to claim 59 wherein the metal-ceramic based composite includes metallic phases, intermetallic phases, oxides, nitrides, carbides or silicates.

65. (New) The method according to claim 64 wherein the metallic phases, intermetallic phases and oxides include $Ti(Al, O)$, $Ti_3Al(O)$ and $TiAl(O)$ and Al_2O_3 .

66. (New) The method according to claim 59 wherein the ceramic component that increases in size is Al_2O_3 .

67. (New) The method according to claim 66 wherein the mean particle size of the Al_2O_3 is increased by the heat treatment which brings about coarsening of the Al_2O_3 particles.

68. (New) The method according to claim 59 wherein the metal-based ceramic composite is crushed and milled following heat treatment to form the powder.

69. (New) The method according to claim 68 wherein the crushing or crushing and milling occurs in an inert environment such as under argon or a vacuum.

70. (New) The method according to claim 68 wherein the crushing time or crushing and milling time is limited to minimize reduction of the size of the increased size ceramic component.

71. (New) The method according to claim 59 wherein separation of the components is achieved by sedimentation, electrophoresis, electrostatic methods, chemical leaching, magnetic separation, or the like.

72. (New) The method according to claim 59 wherein the volume fraction is greater than about 90%.

73. (New) The method according to claim 59 wherein the oxygen content of the metal rich fraction is less than about 1.5 atomic %.

74. (New) The method according to claim 59 wherein the reducing agent comprises calcium or calcium hydride.

75. (New) The method according to claim 59 wherein the acid comprises formic acid or acetic acid.

76. (New) A method of recovering a metal rich fraction from a metal-ceramic based composite, the method including the steps of increasing the size of particles of at least a ceramic component within the metal-ceramic based composite by heating the metal-ceramic based composite, crushing the metal-ceramic based composite to reduce the size of the metal rich fraction in the composite in comparison to the ceramic component in the composite, and separating the reduced sized metal rich fraction from the increased sized ceramic component to result in a metal rich fraction in powder form having a volume fraction of metal that is greater than about 60%, wherein separation of the components is achieved by a method that includes electrophoresis or magnetic separation.

77. (New) The method according to claim 76 wherein the metal based composite is heated to a temperature of between about 1500°C and about 1650°C.

78. (New) The method according to claim 76 wherein the metal based composite is held at a temperature of between 1500°C and 1650°C for a time of between about 0.5 hours and about 10 hours.

79. (New) The method according to claim 76 wherein the metal is titanium, yttrium or copper.

80. (New) The method according to claim 76 wherein the metal-ceramic based composite includes metallic phases, intermetallic phases, oxides, nitrides, carbides or silicates.

81. (New) The method according to claim 80 wherein the metallic phases, intermetallic phases and oxides include $Ti(Al, O)$, $Ti_3Al(O)$ and $TiAl(O)$ and Al_2O_3 .

82. (New) The method according to claim 76 wherein the ceramic component that increases in size is Al_2O_3 .

83. (New) The method according to claim 82 wherein the mean particle size of the Al_2O_3 is increased by the heat treatment which brings about coarsening of the Al_2O_3 particles.

84. (New) The method according to claim 76 wherein the metal-based ceramic composite is crushed and milled following heat treatment to form the powder.

85. (New) The method according to claim 84 wherein the crushing or crushing and milling occurs in an inert environment such as under argon or a vacuum.

86. (New) The method according to claim 84 wherein the crushing time or crushing and milling time is limited to minimize reduction of the size of the increased size ceramic component.

87. (New) The method according to claim 86 wherein the volume fraction is greater than about 90%.